Comet Cooking

Purpose:
The parts of a comet are revealed as groups of students create a comet using everyday items.

Age Range:
Grade 3 and up – this activity can be scaled down for younger groups.

Materials:
1 Zip-Loc baggie, 1 gallon size
1 pie tin that can fit inside the baggie
3-6 Oreo cookies
1 cup syrup
1 cup dilute ammonia/water mixture (less than 3% ammonia)*
1 pair thick gloves
½ kilo dry ice*

*SAFETY NOTE-
Dry ice is the solid state of carbon dioxide (CO_2). It will sublimate to a gaseous state at about -78° C (-109° F). Do not allow the students to touch the dry ice, because it can cause cryogenic burns. You will want to purchase about 1 kilo of dry ice per comet, because about half of the dry ice will sublime before your class, leaving you with ½ kilo per comet. You may want to substitute rubbing alcohol for ammonia. A very dilute mixture of ammonia will allow the students to recognize the ammonia without being overwhelmed, but too much ammonia can stink up the room. Always perform this experiment in a well-ventilated area. Anyone performing this experiment should wear safety goggles and thick gloves.

Instructions:
1) Place the dry ice in the pie tin. Explain that CO_2 is commonly found in comets, as are other organic compounds.
2) To symbolize the other organic compounds, crumble the Oreos (AKA Oreo-ganic compounds) and add them to the pie tin.
3) Slide the pie tin, complete with comet ingredients, into the Zip-Loc baggie. Dump out the comet material, and remove the pie tin, leaving the comet material behind.
4) In order to achieve the "dirty snowball" consistency that comets are known for, add the syrup, and (while wearing the gloves) mix the materials thoroughly inside the bag.
5) Cut a roughly two-inch slit in the bag. Pour in the ammonia/water solution, explaining that both are found within comets. As soon as the liquid hits the dry ice, it will begin to produce large quantities of fog.
6) Seal the baggie, and explain that you now have the three major features of a comet: the nucleus (materials within the baggie), coma (the cloud of gas inside the baggie), and the tail (which streams out of the baggie via the slit)